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Energy efficiency status of the community housing in Australia

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ABSTRACT

Community housing in Australia provides a range of rental options to low-to-moderate income tenants ranging from short-term crisis accommodation to long-term housing. Most community housing providers rely on rental income as their major source of recurrent funding and the rents are often set to a low percentage of the tenants' income. Therefore, these not-for-profit organizations have to operate within very stringent budgets. Tenants in community housing may also have special needs. Their energy consumption are relatively high, as they spend long hours in their homes. They are therefore particularly vulnerable to increasing energy prices, and in need of the most assistance in reducing these living costs. This paper researches the status of energy use and the needs of the community housing to reduce the energy and water consumption. There appear to be ample opportunities for water and energy efficiency improvement in community housing, e.g. insulation, more energy efficient hot water systems, etc. However, the organizations lack of time, knowledge, fund and expertise to improve energy efficiency makes it hard and thus create a room for the Government to take initiates to reduce carbon from this sector.

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1. Introduction

Community housing (CH) is a very diverse sector in Australia. It encompasses providers ranging from very small to very large organizations, with a multitude of organizational structures and funding models. The sector provides a range of rental options to low-to-moderate income tenants, ranging from short-term crisis accommodation to long-term housing. Many providers also offer other social services and assistance to their tenants. Their tenants are generally on low incomes and often disadvantaged in other ways. Tenants may be aged, have a disability, mental illness and/or drug dependency issues. A recent study by the Community Housing Federation of Australia (CHFA) found that most community housing providers rely on rental income as their major source of recurrent funding [1]. As the rents are often set to a low percentage of the tenants' income, these not-for-profit organizations have to operate within very stringent budgets. Community housing providers determine the subsidized rent of all new tenancies based on a percentage of the assessable household income plus hundred percent of the household's entitlement to Commonwealth Rent Assistance [2].

Property ownership within the sector is mixed. Community housing providers may hold titles for some, all, or none of their dwellings. Some providers are on long-term management contracts with State Housing Agencies and other similar government organizations.[1] Community housing varies between each state and territory, and is not governed by the Federal Government. The dwellings are also a mixture of newly constructed and pre-existing buildings, with the latter either purchased, or received via a transfer of ownership from state housing. The sector has experienced rapid growth in recent years, with a significant amount of state-owned housing stock being transferred to large 'growth' providers across the country. This has dramatically increased the proportion of dwellings both owned and managed by these CH providers.

With little or no recurring government funding and a heavy regulatory compliance workload, these organizations are both time and resource poor. Tenants in community housing are often on low incomes, and may also have special needs. Their energy consumption rates are relatively high, as they spend long hours in their homes. They are therefore particularly vulnerable to increasing energy prices, and in need of the most assistance in reducing these living costs.

The Australian Government's $6.4 billion Social Housing Initiative [3], launched in 2009, created another impetus for expansion of the community housing sector. Organizations were encouraged to apply for allocated funding for new construction and refurbishment of existing social housing in every jurisdiction. At the time of this study, many providers were busy submitting project proposals for this Initiative.

[1] The exact arrangements with State Housing Agencies vary from state to state. For example, in Western Australia, many community housing dwellings are under head lease from the WA Department of Housing (Foundation Housing 2009), with the providers acting as property managers. In South Australia, the community housing provider "(technically) owns the property, [with] a 'debenture' mechanism which means that the state government retains total control over the full market value of the property at all times" CHCSA, 2009.

1.1. Background on the government initiatives for community housing

The National Strategy for Energy Efficiency was launched in July 2009 to systematically improve energy efficiency in households and businesses as part of the Australian Government's commitment to combat Climate Change. To reduce emissions from residential sector, the Department of the Environment, Heritage, Water and the Arts (DEWHA) initiated the Green Loans Program that aims to provide expert advice to over 300,000 households on how to become more sustainable. Green Loans was aimed at Australian householders to help improving energy and water efficiency in their home. The programme provided the household with a free Home Sustainability Assessment (HSA) which was conducted by suitably qualified assessor. A Green Loans Assessment Report was then posted out to the house holder. The report provided valuable information advising on certain priority areas to the householder. Recommendations were made to help improve the efficiency of the home. The second component to the Green loans program was a subsidized interest free 'Green Loan' of up to $10,000 to make the improvement suggested in the HAS (DCCEE, 2010). The Program was targeted to privately owned dwellings, and aims to increase energy and water efficiency through technology and behavioural change. This program is closed now.

Despite their diversity, community housing providers share their principles of social justice and encourage tenant participation in the management of their housing. Their tenants are generally on low incomes and often disadvantaged in other ways. Tenants may be aged, or have a disability, mental health issues and drug dependencies. A recent study by the Community Housing Federation of Australia (CHFA 2007) found that most community housing providers rely on rental income as their major recurrent funding source (Fig. 1).

To address the above issues of CH, government recognizes that a different approach may be needed to engage the community housing sector to address the issues of reducing carbon emission through energy efficiency measures. This paper provides a snapshot on the size and demographics of the CH sectors in Australia, and gains an insight into the current status of energy efficiency in their dwellings. It also aims to identify the options to reduce the carbon emission and explores the ways in which the community housing sector could assist in increasing energy and water efficiency in their dwellings.

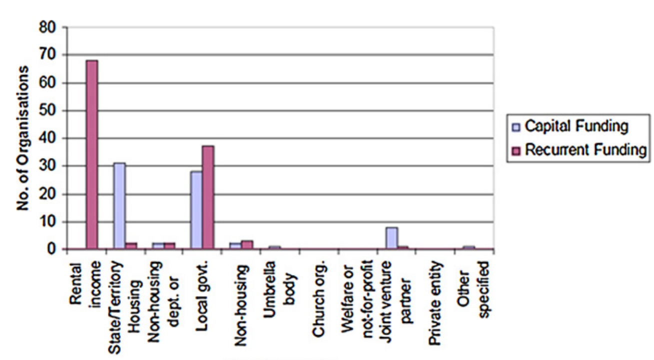


Fig. 1. Funding/income sources for community housing providers. *Source*: CHFA 2007.

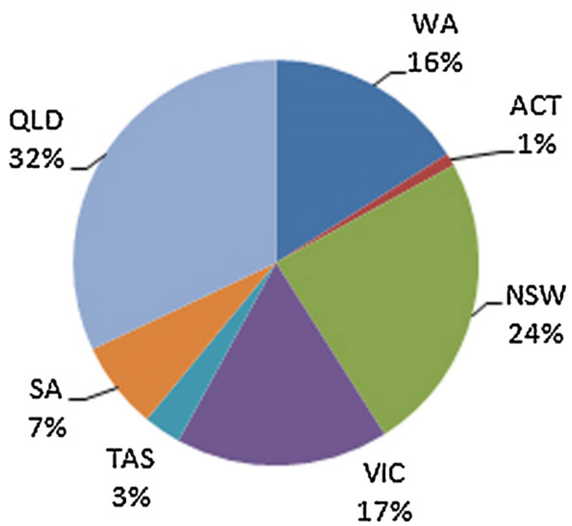


Fig. 2. Distribution of community housing providers based on CHFA data (2007).

2. Demographic information on community housing

There are currently around 1800 community housing providers in Australia (CHFA 2007), although the numbers are in constant flux, with a whole sector shift toward larger growth providers. Many of the smaller providers are now in the process of merging with each other (ARCH 2009).

Above figure (Fig. 2) shows the distribution of community housing providers in Australia. The largest number of providers is found in Queensland (540), followed by New South Wales (420), Victoria (300) and Western Australia (270).

The CHFA Mapping Project [1] found that the sector is "dominated by a large number of small organizations managing a small number of dwellings". Around two-thirds of the survey respondents manage fewer than 20 dwellings, while only 5% have more than 200 dwellings.

Many of the providers are in partnership with support providers, local government, public housing agencies or the private sector (NSWFHA 2007). In some cases, the providers are specialist support providers (e.g. for a group of people with a specific disability), who have community housing as part of their portfolio (e.g. The Autism Association 2009).

In some states (such as New South Wales), indigenous housing is a distinct sector, managed by the Department of Housing. In other states, indigenous housing is an integral part of community housing. In Western Australia and Queensland, for example, some of the large growth providers manage a diverse portfolio, with indigenous housing in remote regions as part of the mix.

Five broad categories of community housing providers were identified by the CHFA's Mapping Project (2007):

- Community housing organizations.[2]
- Welfare/not-for-profit organizations.[3]
- Housing cooperatives.[4]

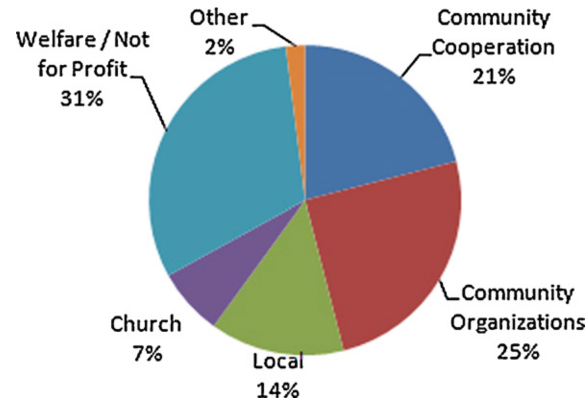


Fig. 3. Proportion of providers by type.
Source: CHFA 2007.

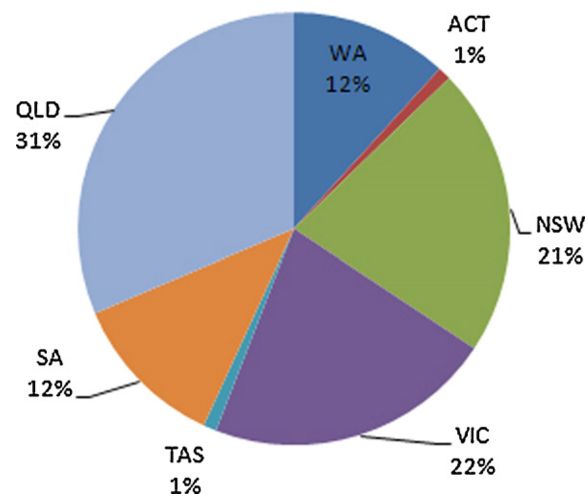


Fig. 4. Distribution of dwellings in community housing in different states.

- Church based organizations.[5]
- Local government organizations.

Fig. 3 shows the proportionate breakdown by organization type of the respondents to the CHFA survey. It should be noted that the data for this chart corresponds to only 613 out of a total of around 1800 community housing providers in Australia (around 34%). No primary data set was available to perform a rigorous sectoral breakdown, as membership lists and organizational information were not readily available.

2.1. Dwelling number and types

There are an estimated 37,000 dwellings that are managed by the community housing providers [4]. This figure is likely to increase significantly as the sector is expected to continue rapid expansion in the foreseeable future (as a result of the transfer of public housing to community housing and the Social Housing Initiative 2009).

Fig. 4 shows the distribution of dwellings managed by CHP around Australia, estimated from various sources.[6] Queensland,

[2] A community housing organization is a not-for-profit organization that is often linked to other community support services.

[3] A welfare/not-for-profit organization is one that provides housing assistance as part of their support services.

[4] A housing cooperative is a not-for-profit organization that is managed by tenants (i.e. selfmanaged). Responsibility for the day-to-day management is usually shared among tenant members.

[5] Church based organizations are ecumenical organizations that provide housing assistance.

[6] Various sources including Department of Housing and Community Services of the ACT (DHCS 2009), New South Wales Federation of Housing Association (NSWFHA 2007), Queensland Community Housing Coalition (QCHC 2009), Community

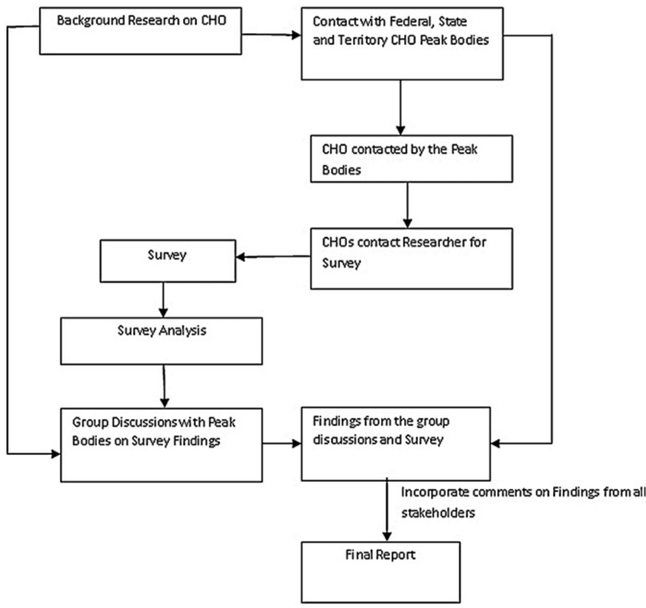


Fig. 5. Methodology flow chart.

New South Wales and Victoria have the highest number of dwellings.

3. Methodology of the research

A top-down approach was adopted for this project. Due to the large number of community housing providers, and a short project timeframe, the research team had to find the most efficient means to engage this hard-to-reach sector. At the beginning of the project, the research team approached to all the federal, state and territory peak bodies of the sector and obtained their support. They were then invited to promote the project through their networks and encourage their member organizations to participate in the project survey. The survey was done by telephone interview. An energy matrix questionnaire was also sent to the participant by and by mail to find out the information of building types, the appliances used for heating and cooling, etc.

The peak bodies were also invited to represent their members at a Key Stakeholder Consultation Meeting to discuss issues and ideas they may have relating to the Green Loans Program.

The methodology used for this research is summarized in the following flowchart (Fig. 5). The researchers also used their personal contacts with two local organizations to gain some insight into the day-to-day operations and concerns with energy and water efficiency before, and during, the survey development.

3.1. Key contacts establishment

Key points of contact were established with community housing peak bodies, including the Community Housing Federation of Australia, and all the state and territory peak bodies they nominated. They became the research team's conduit into the wider community housing sector and were instrumental in recruiting participants for our project through e-bulletins, newsletters and members' meetings.

Housing Coalition of South Australian (CHCSA 2009), Shelter TAS (2009), Community Housing Federation of Victoria (2009), Community Housing Coalition of Western Australia (CHCWA 2009).

3.2. Survey development

A two-part survey, consisting of a short questionnaire and a Building Information Matrix (see Appendix I), was developed for the research, to ascertain the following:

- Type of organization & location.
- Number & ownership of dwellings.
- Building information of the dwellings.
- Current status of energy and water efficiency.
- Concerns and priorities in energy and water efficiency.
- Issues preventing the improvement of energy and water efficiency.
- Whether Home Sustainability Assessments (HSAs) would be of benefit.
- Potential issues with conducting HSAs in their dwellings.
- How any program like Green Load could be adapted to suit the organizations.

3.3. Telephone interviews

Telephone interviews were scheduled with the organizations that responded to project advertisement distributed through the peak body networks. At the appointed time, our Data Analyst makes the call to the person of contact to conduct the interview over the phone.

3.4. Key Stakeholder Consultation

Representatives from the Community Housing Federation of Australia, each state and territory peak body, and the Green Loans Office, were invited to a Key Stakeholder Consultation Meeting in August. The one-day event comprised of a short presentation of the project's preliminary findings and roundtable discussions with the attendees. The representatives were invited to comment on the findings and discuss issues that they may have relating to adapting Green Loans for community housing in general.

A Meeting Summary was distributed to all stakeholders to receive their feedback and comments. Discussions were held with the previous Green Loans Office regarding the outcomes of the Key Stakeholder Meeting.

3.5. Data analysis

Information collected from the survey and stakeholder consultation was analysed and used to determine the most cost-effective options for the implementation of Green Loans in community housing.

4. Survey results

4.1. Respondent's demographics

There were a total of 38 respondents to the survey. However, of the total number of respondents, only 34% completed both the qualitative survey and Building Information Matrix.

The highest response rates came from New South Wales (32%) and Tasmania (18%). Fig. 6 shows a state-by-state breakdown of survey respondents. Overall, the response rate was low due to a number of factors affecting community housing organizations at the time the survey was being conducted.

A total of 3377 dwellings were surveyed. The largest number of dwellings surveyed was from NSW (42%) followed by WA (32%), owing to the higher number of respondents from these states. The

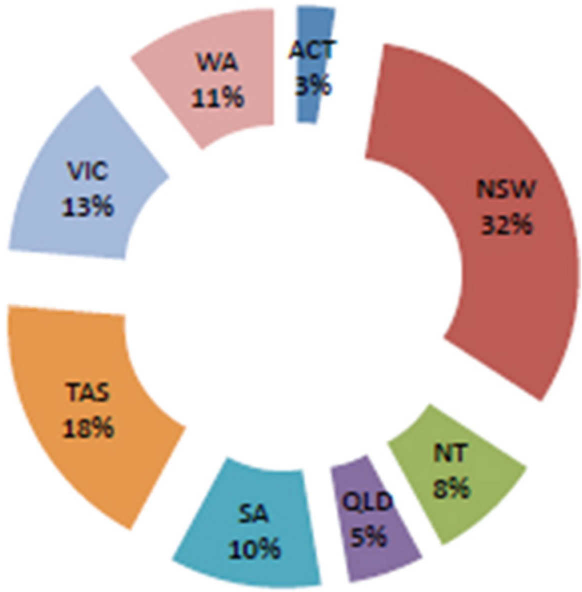


Fig. 6. CHP survey respondents by state/territory.

least number of dwellings surveyed were in Victoria, due to the low response rate.

4.2. Dwelling types

The majority of dwellings (50%) surveyed are free standing, i.e. they do not share common walls with adjacent dwellings or properties (see Fig. 7). Semi-detached dwellings are defined as those that share common walls, and include townhouses, duplexes, triplexes and other grouped dwellings. Apartments are buildings containing multiple dwellings across multiple floors, such as apartment blocks and flats. Significantly, apartments represent the next largest dwelling type (39%), and are sometimes used as short-term lodging houses and crisis accommodation.

Approximately one-third of the dwellings surveyed are owned by the organizations that responded to the survey (Fig. 8). Ownership is defined as the organization holding title over the property, and not needing to seek permission from another agency or organization when making decisions regarding the property. Around 50% of the dwellings are managed by the organization on behalf of another agency – the typical scenario being a State or Territory Department of Housing holding a title to the property, and delegating the management and maintenance to the organization in question.

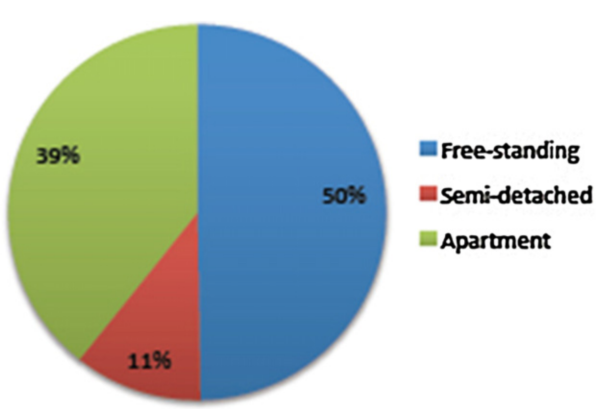


Fig. 7. Dwelling types.

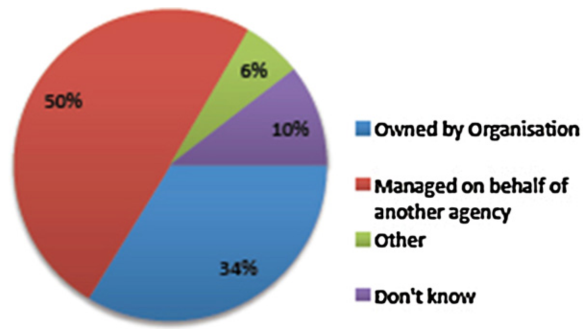


Fig. 8. Ownership status.

4.3. Current status of energy in CH

Building energy efficiency is one of the cheapest and most effective forms of abatement that can help to meet pollution reduction targets. Australia's national greenhouse emissions are more than 550 millions tonnes per year of which residential sectors accounts for around 20% of this total. The average household emits about 14 tonnes of greenhouse gases per home each year [5].

Australian residential energy use by activity is shown in Fig. 9. Space conditioning (mainly heating) dominates energy use, with 38% of total energy. This is followed by water heating, at 25%. Electrical appliances and lighting comprise 30% of energy use, with cooking comprising 4% and 3% as standby [6].

The majority of dwellings surveyed are connected to both an electricity and gas energy source (96% and 72%, respectively), and a small percentages are also equipped with LPG and Diesel (4% and 6% respectively). Despite enthusiasm and interest from some organizations surveyed, no dwellings are currently connected to a renewable energy system. This is most likely due to the high initial cost and long payback period for such systems.

Electricity provides 45% of total residential energy, and generates 83% of greenhouse gas emissions from residential energy use, due to the predominance of high greenhouse intensity coal-fired electricity generation [7]. Over a quarter of this electricity is believed to be used for heating water, and half for appliances. More than 70% of present Australian residential energy use provides low grade heat for space and water heating and cooking. Australia's present housing stock is thermally poor, with less than two thirds of homes having ceiling insulation and less than a fifth having wall insulation [8].

Some of the organizations surveyed were responsible for paying utility bills, particularly in shared housing such as boarding houses and crisis accommodation. Most of these organizations are concerned with both energy and water efficiency, due to rising costs. Most respondents rated their current status of water and energy efficiency as either average or good (see Figs. 10 and 11).

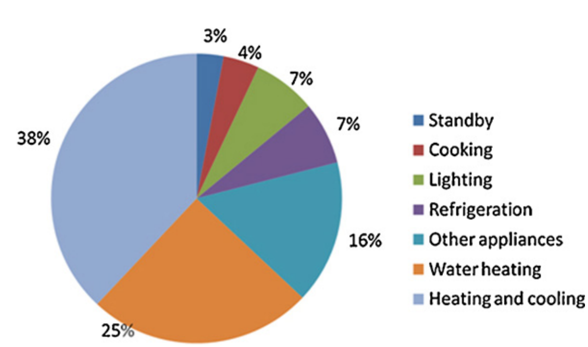


Fig. 9. Average major areas of energy use in residential sector.
Source: [6].

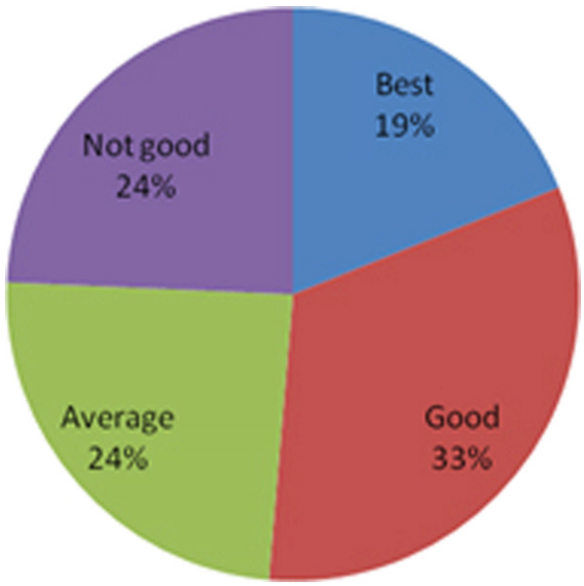


Fig. 10. Energy efficiency.

Overall, respondent organizations felt that their water efficiency was greater than their energy efficiency (70% of total compared to 57%, respectively). This was particularly the case in those states with current stringent water restrictions, such as New South Wales and Victoria.

4.4. Approximate age of construction

Surveyed dwellings covered a wide age spectrum (Fig. 12). While a number of organizations are in possession of dwellings constructed from 2000 onwards (20%), some CHPs have dwellings originally constructed prior to 1950. As minimum energy efficient requirements were proposed as part of the Building Code of Australia in 2000, and introduced into legislation in 2002, it can be assumed that dwellings constructed after this time should meet a reasonably energy efficient standard. Dwellings constructed prior to this time (80%), are less likely to be as energy efficient.

A number of CHPs advised that they frequently 'inherit' aged building stock from state government agencies (that may even be in a dilapidated condition), upon which they assume responsibility for all upgrades, repairs and ongoing maintenance.

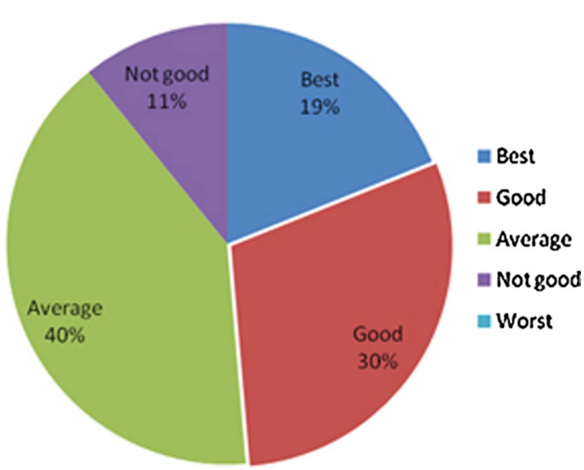


Fig. 11. Water efficiency.

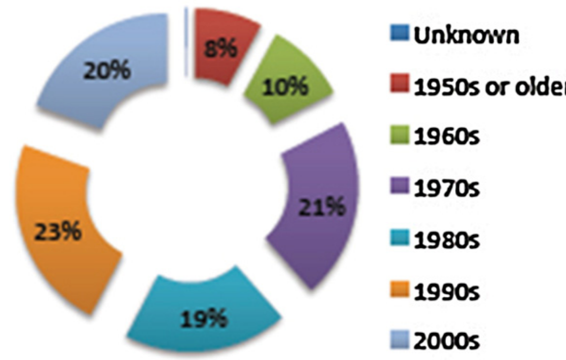


Fig. 12. Approximate age of the building.

4.5. Floor, wall and roof construction

Building materials such as concrete and masonry have a high level of thermal mass that, if deployed appropriately, can be used to moderate the effect of extreme temperatures. This is dependent on the prevailing climate, building design and orientation.

The vast majority of dwellings surveyed are constructed with concrete floors (75%), brick external walls, including both cavity brick and brick veneer construction (52%), and metal or tiled roofs (95% of total), as shown in Fig. 13. While this data alone does not present the full picture of current energy efficiency status, thermal mass, coupled with occupant behaviour, can have a significant influence on the energy efficiency potential of a building.

4.6. Insulation

More than 50% of potential heat gain and loss occurs through the building fabric (Fig. 14). Insulation in floors, walls and roofs of a building can help to minimize undesirable heat gain and loss. The effectiveness of insulation is dependent upon the appropriate type and *R*-value, based on the prevailing climatic conditions.

As is typically the case with domestic construction, the vast majority of dwellings surveyed do not have any floor or wall insulation (Fig. 15). This is also likely to be the case with dwellings that have been constructed within the last ten years, as the energy efficiency regulations of the Building Code of Australia do not specifically require the installation of floor and wall insulation. While almost half of dwellings surveyed have some form of roof or ceiling insulation (48%), there are still significant percentages that do not have any insulation (52% of total).

4.7. Hot water systems

Water heating is another area where future conventional energy requirements can be expected to decline sharply. A variety of hot water systems were present in the dwellings surveyed (Fig. 16). A majority of dwellings have either a gas-storage or gas-instantaneous system (28% and 15%, respectively). Around 23% of dwellings have a solar hot water system (16% electrically boosted and 7% gas boosted). Less than 1% of dwellings have a hydro-ignition system (classified as 'Other'). Almost 30% of dwellings are serviced by energy inefficient electric systems. Electric storage systems accounted for 24%, and electric instantaneous made up the remaining 6%. Around one third of the energy used for water heating is lost from storage tanks and fittings.

4.8. Heating and cooling

Around 50% of dwellings have no cooling system installed (Fig. 17). However, it is possible there are cooling devices that

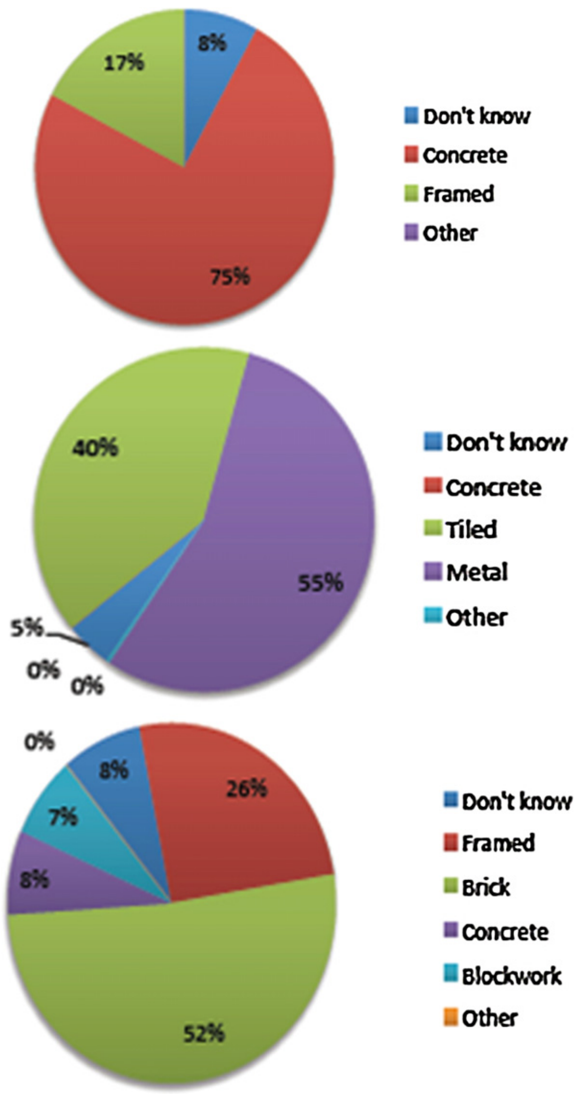


Fig. 13. Construction material used for floor, roof and wall.

have been installed without the organization's knowledge, such as pedestal fans, mobile cooling units and window air-conditioners. 39% of dwellings rely on natural ventilation to achieve cooling. However, it is not known if naturally ventilated dwellings have been consciously designed to capture prevailing winds for cooling purposes.

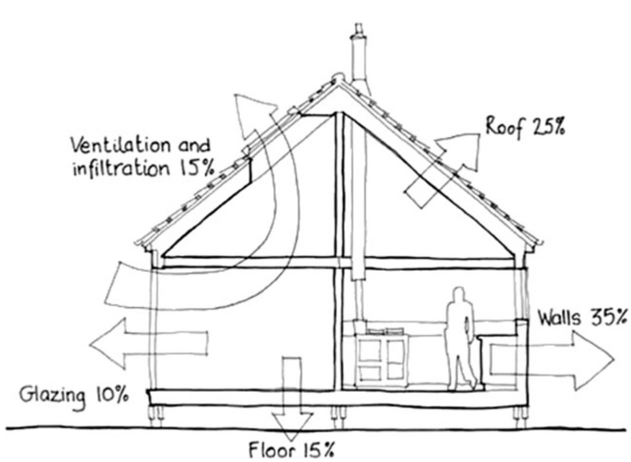


Fig. 14. Typical heat loss and gain through building fabric.

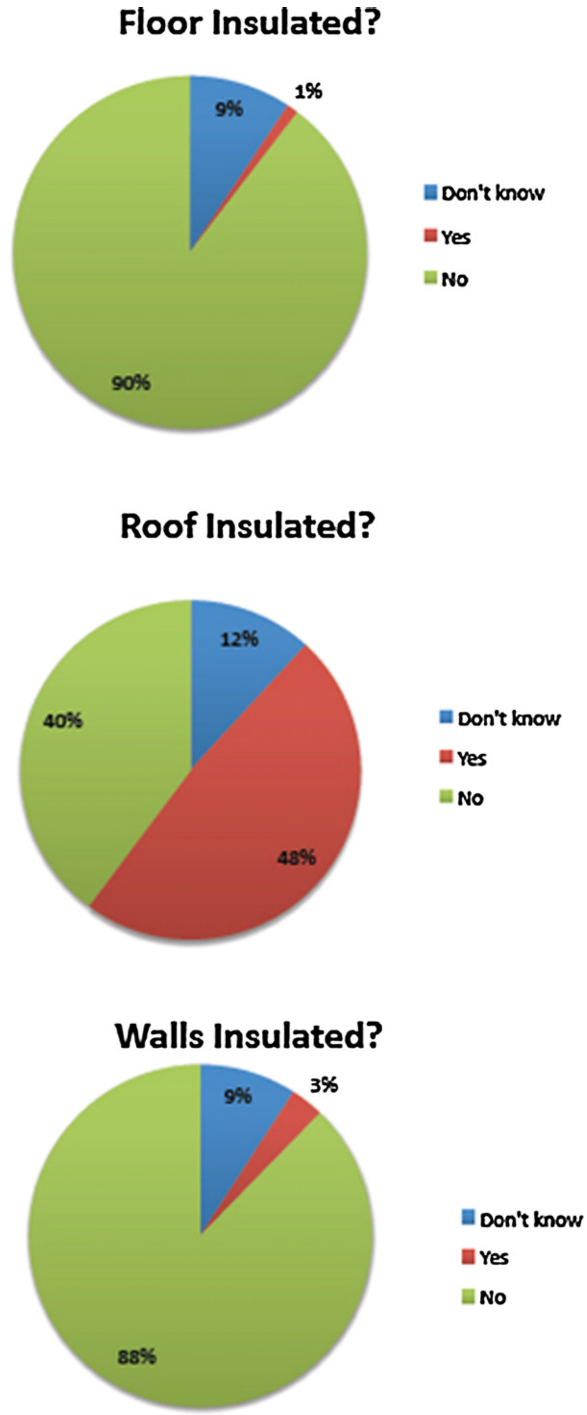


Fig. 15. Insulation of floors, walls and roof.

A small percentage of dwellings have an individual split-system installed (2%), while there are no dwellings with ducted or zoned air-conditioning systems. As with cooling, a significant proportion of dwellings have no heating system installed (38%), as shown in Fig. 18. Where no heating system has been installed, it is not known if tenants may have purchased their own heating appliances, some of which may be very energy inefficient. Around 3% of dwellings have been reported as using solar passive heating (classified as 'Other').

5. Issues preventing better energy and water efficiency

Respondents identified a number of issues preventing better water and energy efficiency (Fig. 19). Over 75% of respondents

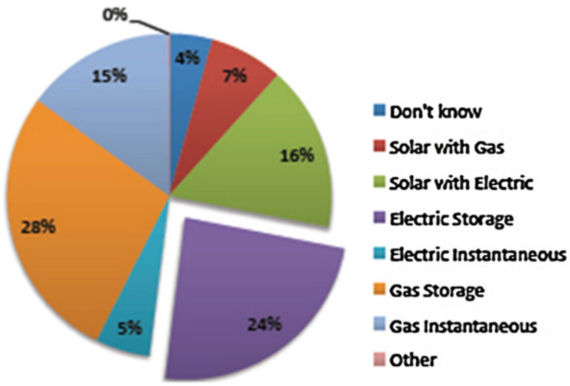


Fig. 16. Hot water systems used in the surveyed households.

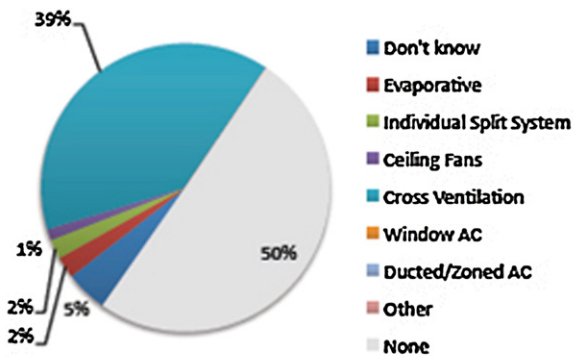


Fig. 17. Type of cooling system used in the CH surveyed.

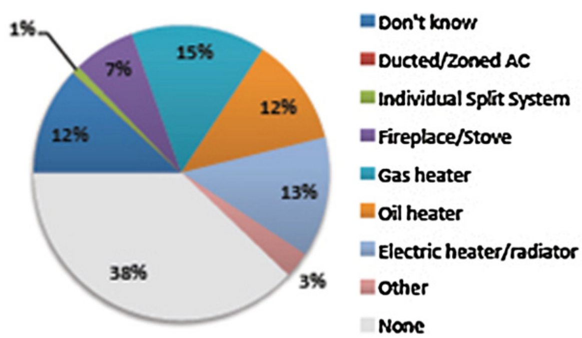


Fig. 18. Types of heating systems used in the surveyed CH.

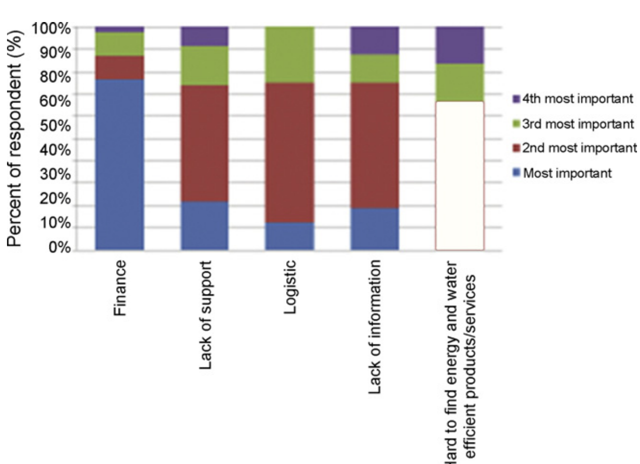


Fig. 19. Issues preventing better energy and water efficiency for the CHPs.

identified financial constraints as the most important issue preventing organizations from becoming more energy and water efficient. More than 65% of respondents reported difficulty in sourcing energy and water efficient products and services as another major impediment. Lack of logistical support, information and expertise are other major issues identified.

The lack of financial resources and the perception of energy efficiency measures being cost-prohibitive were common remarks given by respondent organizations. For example, measures such as installing insulation, curtains, and purchasing energy efficient appliances were considered as being beyond their budget. At least one respondent believed that dwellings could not be simultaneously sustainable and affordable. In some states, subsidies previously available for certain energy and water efficiency improvements (e.g. water tanks) have now been discontinued, further exacerbating these financial difficulties. Lack of time and human resources is another preventing factor. Many organizations operate on minimal staff and resources, and already have a heavy workload. The additional responsibility for implementing energy and water efficiency measures could be considered as onerous to staff. Some organizations believed that there is a lack of practical advice and information available, making it difficult for them to identify energy and water efficiency opportunities. For example, one organization reported that some measures already taken were ineffective or inappropriate. This suggests that without specific knowledge in water and energy efficiency, some organizations find it difficult to determine the most cost-effective improvements. Some organizations also find it difficult to locate energy and water efficient products and service providers.

Respondents rose following concerns regarding energy and water efficiency:

- Community housing tenants can have comparatively higher levels of energy consumption compared to the average householder because they occupy their dwelling for a greater number of hours, due to factors such as unemployment, disability, or age.
- Tenants have a low understanding or awareness of electricity and water use; for example some may have intellectual disabilities or difficult personal circumstances.
- Many properties are old and not very energy or water efficient.
- There is room for improvement in existing buildings.
- Where tenants do not pay water bills, they do not make any attempt to minimize water use.
- There can be excessive use of electricity where tenants do not switch off lights or appliances when not in use, or where inefficient lighting has been installed.
- Water is not currently metered, therefore it is difficult to understand water usage and raise awareness among the tenants.
- It is difficult to monitor how much energy tenants are using in some dwellings.
- Tenants may be using energy inefficient appliances such as electric bar heaters.
- Some energy efficiency measures already in place are ineffective or inappropriate.
- Dwellings with air-conditioning are not very energy efficient.
- Some properties have very poor design in terms of energy efficiency.
- Energy efficient appliances are much more expensive to purchase, and tenants cannot afford them.
- Lack of funding prevents the installation of more efficient light globes and shower heads.

Many organizations are keen to improve water and energy efficiency in their dwellings where possible. Some are already trying to be sustainable and have implemented policies on constructing energy and water efficient dwellings. Some organizations are

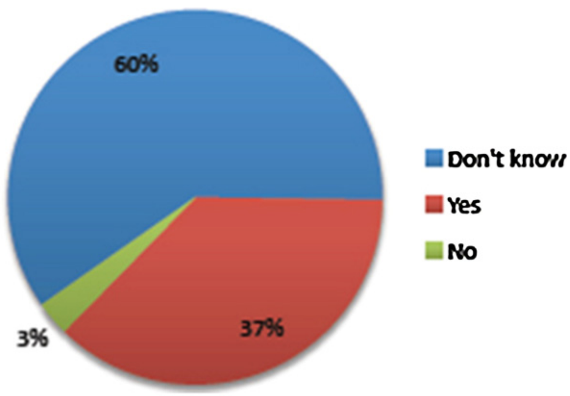


Fig. 20. Tenants having special needs of the surveyed CH.

conducting their own energy audits and tenant awareness campaigns, while others are installing energy and water efficient appliances as funding allows. One respondent expressed the desire to be totally self-sufficient, in contrast to another, who listed energy and water efficiency as low on a list of organizational goals. For some community housing tenants, energy and water efficiency are unlikely to be a high priority due to personal circumstances and issues such as substance abuse, domestic violence, mental illness and disability.

Special needs and requirements for some tenants were also identified as a constraining issue (Fig. 20). Around 37% of surveyed dwellings have occupants with identified special needs – these include tenants that suffer from mental illness, disability, substance abuse, or domestic violence. This percentage could be significantly higher because, for about 60% of dwellings, it is unknown if there were tenants with special needs.

There is also the split incentive problem, whereby the organization may make the technology changes at their cost, but only the tenants will benefit, as they are responsible for their own bills. Even so, many organizations are keen for their tenants to become more energy efficient, as they are mindful of their tenants' vulnerability to rising energy and water costs.

6. Options for improving EE in community housing sector

6.1. Suitability of the Home Sustainability Assessment for community housing

The majority of surveyed organizations (87%) believed that they, and their tenants, would benefit from a Home Sustainability Assessment (HSA). These respondents saw the HSA as a valuable opportunity for:

- Conducting a face-to-face conversation with tenants regarding energy and water efficiency.
- Increasing tenant and staff awareness of energy and water use.
- Identifying opportunities for water and energy efficiency improvements at no cost.
- Educating tenants by providing tips and recommendations.
- Reducing electricity and water costs to tenants through better energy and water efficiency.
- Helping tenants to identify areas of major consumption.
- Assessing the energy and water efficiency of older buildings, and recommending the most cost-effective measures.
- Assisting organizations to identify energy and water efficiency opportunities in new housing developments.
- Enhancing or adding to the data collected by community housing organizations.
- Providing a current status of energy efficiency, e.g. insulation and passive solar.
- Providing vital information for developing energy and water efficiency policies.
- Providing evidence of the need for improvement to the housing authorities concerned.

However, some of these organizations also raised a number of concerns with the HSAs:

- Some tenants do not cope well with strangers visiting and changes in routine.
- Organizations and tenants need to give permission prior to the visit.
- May have to sign a confidentiality agreement before entry is permitted.
- HSAs will benefit tenants, but not the organization.
- Are relevant for existing buildings only, but new building design also needs to be improved.
- Tenants receiving individual HSAs may demand recommended changes which are beyond the budgets of CHPs.
- Technology change alone may reap environmental benefits, but not raise tenant awareness.
- Could result in many telephone enquiries to the organizations.
- Organizations would prefer to provide the information to their tenants directly, rather than via an outsider/assessor.
- No commitment (on behalf of the organization) should be made by the assessor.
- A single program may not be able to target all tenants as there is a wide demographic in community housing.
- Geographically specific assistance may be appropriate.

Some providers and peak bodies also have the following suggestions:

- Portfolio-wide assessments for CHPs would be useful, but HSAs need not be performed on every dwelling.
- A sample of like dwellings should be assessed, then the asset/property manager may be given technical advice during an in-depth interview.
- The HSA can be made part of the annual monitoring process (conducted by an external assessor) currently required of all "housing providers".
- Organizations need a training program as they do not currently have any knowledge on EE and WE.
- Better to do HSAs through CHPs, who can disseminate the information through newsletters, etc.
- Work with, and train, maintenance officers, and build energy efficiency into maintenance policy.
- Co-operatives may be better placed to take advantage of HSAs, as they tend to be tenant operated.
- Tenant councils may be a better means of reaching tenants than CHPs.
- An organization could send a representative to accompany the assessor to ensure that promises are not made.
- The assessor should report to the community housing organizations and assist them in making efficiency improvements.
- It would be beneficial if an energy consumption monitoring device can be provided along with the HSA.
- Community housing sector specific assessments would be a good idea for tenants and organizations alike.
- Energy and water efficiency awareness/training for tenants could be channeled through some of the larger providers.
- Large growth providers should be targeted to maximize the impact of the program, while smaller providers may be reached through the state/territory peak bodies.

Thirteen percent of respondents do not think that HSAs are a good option for them. The reasons given include:

- HSAs do not make any sense for CHPs.
- HSAs will not benefit tenants.
- HSAs provide very little benefit for the organizations.
- It should be up to the tenants to decide whether to have an HSA.
- Tenants would expect the organizations to make their properties GREEN.
- It would create unrealistic expectations among the tenants.
- While HSAs may benefit the tenants, the organizations cannot make any changes to properties they manage on behalf of State Department of Housing.
- Registered charities are vaguely included as the scheme focuses on individual dwellings and assumes that the resident is making their own application.
- A number of dwellings have poor solar access which makes it difficult to implement any energy efficiency measures, for example, solar hot water systems cannot be installed on these buildings.

6.2. *Suitability of low cost loans for community housing*

Most key stakeholders consulted were of the opinion that low-cost Green Loans may not be the most suitable vehicle for better energy and water efficiency in community housing. As the main objective of community housing organizations is to provide social service, energy and water efficiency are not regarded as their core business or service. Moreover, some providers may lack motivation, as they do not own the titles for their properties.

Feedback received from survey respondents and key stakeholders strongly indicates that most community housing organizations would find it extremely difficult to service loans in order to fund energy and water efficiency improvements in their properties. As providers receive little ongoing funding, and rely heavily on (often "capped") rents from their low-income tenants, many of these organizations operate on very tight budgets, and so would not have the ability to repay a loan, even if an interest-free period were offered. Key stakeholders believe that HSAs should be offered independently from the Loans. They would also like to see a higher proportion of financial resources being allocated to this sector, as tenants are more vulnerable and least able to cope with higher energy and water prices. They also feel that collective funding applications through peak bodies would be beneficial, as the organizations are burdened with too much paperwork already. It would also make bulk purchases easier and give them better bargaining power.

Recently Australian Government initiate a program called, 'Low Carbon Communities program' which has been expanded to include support for energy efficiency activities in low income households. The program support energy efficiency upgrade to council and community organizations and in low income households [9]. This program helps the low income households and community households to find more sustainable ways to manage their energy consumption.

7. Conclusion

Most of the dwellings of community housing are located in the major cities, but there are also dwellings in regional and remote areas. Their age of construction covers a wide spectrum, but the vast majority is more than 10 years old. Survey results show that community housing providers feel that energy and water efficiency can be improved in their dwellings, and that tenant awareness of these issues should be raised.

There appear to be ample opportunities for water and energy efficiency improvement in community housing, e.g. insulation, more energy efficient hot water systems, etc. However, the organizations lack of time, knowledge, fund and expertise to make changes themselves makes it hard and thus create a room for the Government to take initiates to reduce carbon from this sector. Some organizations are partnering with commercial firms to develop their own initiatives on sustainable practices, although a minority does not feel they can spare the time or money to make a difference.

There is also the split incentive problem, whereby the organization may make the technology changes at their cost, but only the tenants will benefit, as they are responsible for their own bills. Even so, many organizations are keen for their tenants to become more energy efficient, as they are mindful of their tenants' vulnerability to rising energy and water costs. Most providers believe that Home Sustainability Assessments would be beneficial to their organization and tenants. However, a modified approach may be required to take into account special needs of their tenants, and follow normal channels of communication. A majority of stakeholders also believe that the Loan component may have to be adapted to allow better access by the sector.

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